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10/816,403	04/01/2004	Robin J. Guthrie	C-2480	9610
7590	09/21/2009		EXAMINER	
M. P. Williams 210 Main Street Manchester, CT 06040			WALKER, KEITH D	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/816,403  
Filing Date: April 01, 2004  
Appellant(s): GUTHRIE, ROBIN J.

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M. P. Williams  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed June 5, 2009 appealing from the Office action mailed July 16, 2008.

The appeal brief is filed in the new format under the revised BPAI final rule before the effective date of the BPAI final rule. The Office published the BPAI final rule to amend the rules governing practice before the BPAI in *ex parte* patent appeals. See *Rules of Practice Before the Board of Patent Appeals and Interferences in Ex Parte Appeals; Final Rule*, 73 FR 32938 (June 10, 2008), 1332 Off. Gaz. Pat. Office 47 (July 1, 2008). However, the effective date for the BPAI final rule has been delayed. See *Rules of Practice Before the Board of Patent Appeals and Interferences in Ex Parte Appeals; Delay of Effective and Applicability Dates*, 73 FR 74972 (December 10, 2008). In the notice published on November 20, 2008, the Office indicated that the Office will not hold an appeal brief as non-compliant solely for following the new format even though it is filed before the effective date. See *Clarification of the Effective Date Provision in the Final Rule for Ex Parte Appeals*, 73 FR 70282 (November 20, 2008). Since the appeal brief is otherwise acceptable, the Office has accepted the appeal brief filed by appellant.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,255,011	FUJII et al.	7-2001
2004/0197633	YAMAMOTO et al.	10-2004
2004/0101736	TAWFIK et al.	5-2004
5,300,370	WASHINGTON et al.	4-1994
WO/2001/067532	YAMAMOTO et al.	9-2001

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

*Claim Interpretation*

Regarding claim 1, this claim is being interpreted as a Jepson claim, since the claim language states, "characterized by the improvement comprising". As such the preamble is considered known prior art and is interpreted as such per MPEP 608.01 (i).

Regarding the terms 'grooves' and 'transverse channel portions' in the limitations, since a difference between these two terms is not provided in the specification, the two words are interpreted as having the same meaning.

***Claim Rejections - 35 USC § 102***

Claims 1, 2 & 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,255,011 (Fujii).

Fujii teaches a reactant flow field plate having inlet and outlet edges with inlet and outlet portions that extend longitudinally from, at or near the inlet and outlet edge respectively. Flow through channels extends longitudinally and transversely, where some of the transverse portions have more than one groove (Fig. 6; 7:25-40). The flow plate has inlet and outlet portions laterally offset from each other and the transverse portions are in fluid communication between the inlet and outlet portion. The flow plate has multiple holes for making an internal manifold. The number of grooves in the transitional area is altered to accommodate the fuel cell requirements (8:30-45).

Claims 1, 2, 5 & 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 01/67532 (Yamamoto), using US Publication 2004/0197633 as the English translation for citations.

Yamamoto teaches a reactant flow field plate having inlet and outlet edges with inlet and outlet portions that extend longitudinally from, at or near the inlet and outlet edge respectively. Channels extend longitudinally and transversely, where some of the

transverse portions (54 & 54') have more than one groove (54') (Figs. 5 & 6; [0119, 0122]). The flow plate has inlet and outlet portions laterally offset from each other and the transverse portions are in fluid communication between the inlet and outlet portion. The flow plate has multiple holes for making an internal manifold.

Regarding claim 5, the ratio of grooves to transverse channel portions is 1 and the separator plate has dimensions of 20 X 32 cm ([0092]). Since the length and width of the transverse portion is relatively equivalent to the size of the separator plate, the ratio of length to width is about 1.5. Therefore, the two ratios of 1.5 and 1 are "about the same".

Regarding claims 7 & 8, some of the transverse portions have two grooves and none have more than two grooves (Figs. 5 & 6).

#### ***Claim Rejections - 35 USC § 102/103***

Claim 5 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent 6,255,011 (Fujii).

The teachings of Fujii as discussed above are incorporated herein.

Fujii teaches that the number of grooves to the number of transverse channel portions in the transverse flow field area is about the same as an aspect ratio for the length to width of the flow field area (Fig. 6). The ratio of channels to grooves is 1. Looking at figure 6, if the width of the channels and the distance between the channels are given the same value then the transitional area is 18:42, which equals 0.43, thus meets the broad limitation "about the same as".

Alternatively, it would be obvious to one skilled in the art to vary the length and width ratio of the fuel cell to alter the size of the fuel cell or to account for pressure drops in the fuel cell channels as the reactant travels from the inlet to the outlet. By altering the length to width ratio the transitional ratio would also change. Furthermore, Fujii teaches altering the number of grooves in the transitional area which in turn would also alter the length to width ratio (8:30-45). Combining prior art elements according to known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

***Claim Rejections - 35 USC § 103***

Claims 3 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,255,011 (Fujii) in view of US Publication 2004/0101736 (Tawfik).

The teachings of Fujii as discussed above are incorporated herein.

Fujii is silent to interdigitated channels.

Tawfik teaches interdigitated channels that enhance the reaction of the gases with the electrode surface (Figs. 12 & 13; [0048]). The motivation to use the interdigitated channels is to improve the density output of the fuel cell by enhancing the interaction between the reactant gases and the electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the flow fields of Fujii with the interdigitated channels of Tawfik to improve the power density output of the fuel cell.

Claims 3 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,255,011 (Fujii) in view of US Patent 5,300,370 (Washington).

The teachings of Fujii as discussed above are incorporated herein.

Fujii is silent to interdigitated channels.

Washington teaches interdigitated flow channels that force the reactant stream though the adjacent electrode material (Fig. 5; 11:50-68). The motivation to use the interdigitated channels is to improve the amount of reactant interfaces with the electrode. Improving the interaction between the reactant gas and the electrode increases the density output of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the flow fields of Fujii with the interdigitated channels of Washington to improve the power density output of the fuel cell.

Claims 3 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/67532 (Yamamoto), using US Publication 2004/0197633 as the English translation for citations in view of US Publication 2004/0101736 (Tawfik).

The teachings of Yamamoto and Tawfik as discussed above are incorporated herein.

Yamamoto is silent to interdigitated channels.

Tawfik teaches interdigitated channels that enhance the reaction of the gases with the electrode surface (Figs. 12 & 13; [0048]). The motivation to use the

interdigitated channels is to improve the density output of the fuel cell by enhancing the interaction between the reactant gases and the electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the flow fields of Yamamoto with the interdigitated channels of Tawfik to improve the power density output of the fuel cell.

Claims 3 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/67532 (Yamamoto), using US Publication 2004/0197633 as the English translation for citations in view of US Patent 5,300,370 (Washington).

The teachings of Yamamoto and Washington as discussed above are incorporated herein.

Yamamoto is silent to interdigitated channels.

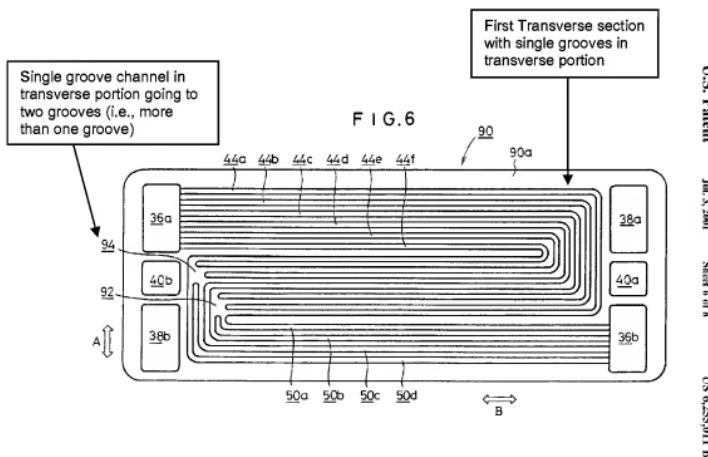
Washington teaches interdigitated flow channels that force the reactant stream though the adjacent electrode material (Fig. 5; 11:50-68). The motivation to use the interdigitated channels is to improve the amount of reactant interfaces with the electrode. Improving the interaction between the reactant gas and the electrode increases the density output of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the flow fields of Yamamoto with the interdigitated channels of Washington to improve the power density output of the fuel cell.

### (10) Response to Argument

*Claims 1, 2 and 6-9, 35 USC 102(b) Fujii (US 6,255,011)*

Appellant argues Fujii does not teach the limitation "some, but less than all of transverse portions having more than one groove." Fujii illustrates a flow plate design in figure 6 (reproduced below) that has two transverse sections. In the first transverse section, each groove has only one groove in the transverse portion, so that meets the "less than all" limitation of the claim. In the second transverse section, a single groove in the transverse portion (92 & 94) forms into two grooves and so has "more than one groove".



Regarding the Declaration of Jeffrey Lake, as discussed in the office action of July 16, 2008, the Declaration filed April 14, 2008 by Jeffery Lake has been considered and found not persuasive. The Declaration provides no supporting evidence for the assertions. The Declaration only amounts to arguments presented in a Declaration form without any other evidence or explanation and so the Declaration is not convincing because all the claimed elements are taught by Fujii as laid out in the above rejection.

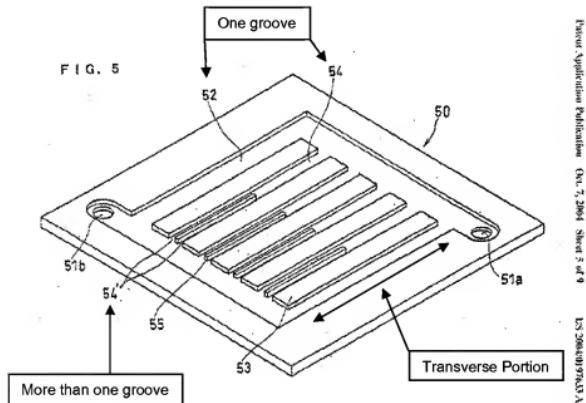
*Claims 1, 2, 5 and 7-9, 35 USC 102(b) Yamamoto (WO/O 1/67532) (US 200410197633 for translation)*

Appellant alleges this and other following rejections are new rejections made in response to claims that were not amended; however, the new rejections are proper since they were presented after the Request for Continued Examination was filed on April 8, 2008. The listing of the office action as a final action was a clerical error that had never before been questioned or asked for clarification by appellant. While these issues are not pertinent to the appeal, an explanation is provided for a complete response to the arguments.

Appellant argues Yamamoto does not teach the limitation "some, but less than all of transverse portions having more than one groove." As discussed in the office action, Yamamoto teaches a flow plate where the transverse portion has one groove and channels with more than one groove. Appellant discusses figure 5 and so this figure is reproduced below with citations as applied to the claims. The transverse portion is interpreted to be the area comprising the channels 52, 54 and 54'. As seen in figure 5

Art Unit: 1795

of Yamamoto, grooves 54 and 52 are single grooves and so meet the limitation, "less than all". The grooves shown as 54' are single grooves split into two grooves and so meet the limitation "some ... having more than one groove."



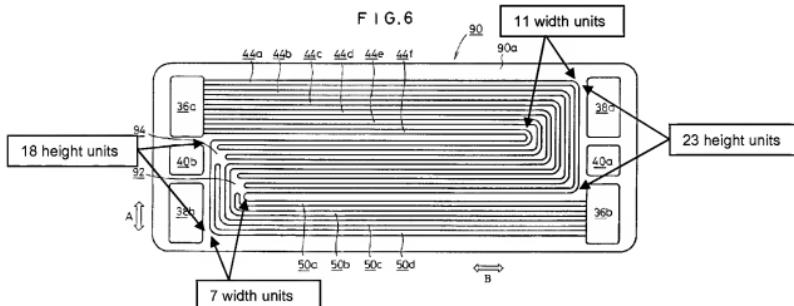
So as illustrated in figure 5, Yamamoto clearly teaches the claimed limitation of "some, but less than all of said transverse portions having more than one groove."

*Claim 5, 35 USC 102(b) or 35 USC 103(a) Fujii (US 6,255,011)*

Appellant argues "The Examiner erred ... where he says of Fujii 'The ratio of channels to grooves is 1.'" However, appellant does not explain why Fujii does not teach this ratio. As stated in the 'Claim Interpretation' section of the rejection, the instant specification does not indicate a difference between channels and grooves and so the two terms are interpreted to mean the same. This interpretation has never been

Art Unit: 1795

challenged by appellant during the examination of the application. Therefore, the number of channels to grooves or as interpreted the number of channels to channels or grooves to grooves is equal to one (1). As for the calculation of the length and width of the transverse flow area, figure 6 is used for an estimate. While figures are not to be relied on for actual proportions, the drawings must be evaluated for what they reasonably disclose and suggest to one of ordinary skill in the art and the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art (MPEP 2125). As the drawings of Fujii teach a ratio that "is about the same as" the channel to channel ratio and Fujii's disclosure teaches altering the number of channels in the transverse area to accommodate and alter the pressure loss of the flow plate, the combination of the drawings and disclosure anticipate or render obvious the claimed limitation.



Appellant appears to argue that Tawfik does not teach interdigitated channels.

Tawfik teaches a flow plate design where the flow channels are completely blocked by projections (80). This design makes the inlet gas flowing in the channel travel up through the electrode assembly and then down the other side of the obstruction in that same channel or down and out the next door outlet channel (Figs. 12 & 13; [0048]). As the actual channel portions that flow gas are offset from each other and the gas can flow either out the same channel or out the adjacent channel, the channels with respect to the gas flow are interdigitated. It would be obvious to one skilled in the art how to incorporate the projections Tawfik into the channels of Fujii and the motivation is to improve the power density output of the fuel cell, as taught by Tawfik ([0048]).

*Claims 3 & 4, 35 USC 103(a) (Fujii (US 6,255,011), Washington (US 5,300,370)*

Appellant provides no arguments to this rejection in the appeal; however, it appears appellant is relying on the arguments of September 21, 2007. Appellant alleges there is no indication how one skilled in the art would accommodate the interdigitated channels with one or two grooves in the transverse area. First, it is noted that no arguments are presented that state why the two references cannot be combined. No arguments or suggestions that the combined references would not operate. Applicant's arguments fail because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Second, appellant's response argues the references individually and one cannot show

Art Unit: 1795

nonobviousness by attacking references individually where the rejections are based on combinations of references. Third, it would be obvious to one skilled in the art to understand how to alter the design of a continuous channel with either one or two channels in a transverse area as taught by Fujii with the interdigitated channels of either Tawfik or Washington.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Keith Walker/

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